(12) EUROPEAN PATENT APPLICATION

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yet been filed

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(54) **Method and communication system for data web session transfer**

(57) A method of operating a communications system such that connections to a first terminal 1 may be diverted to a second terminal 2 comprises the steps of

creating a user profile on a server device 3, the user profile identifying a plurality of terminals 1,2,

generating from the user profile a set of parameters defining a virtual terminal 12, 22,

storing, as parameters of the virtual terminal, details of a current communications session 11 made using a first terminal 1,

on instruction from one of the user terminals 1, 2,

diverting the routing of a communications connection supporting the session from the first terminal 1 to a second terminal 2, and

and transferring the details of the current session 11 to the second terminal for use in continuing the session.

This process allows a user to continue a session on a second terminal if it becomes more convenient to do so, rather than having to start a new session and potentially losing any information obtained whilst using the first terminal.
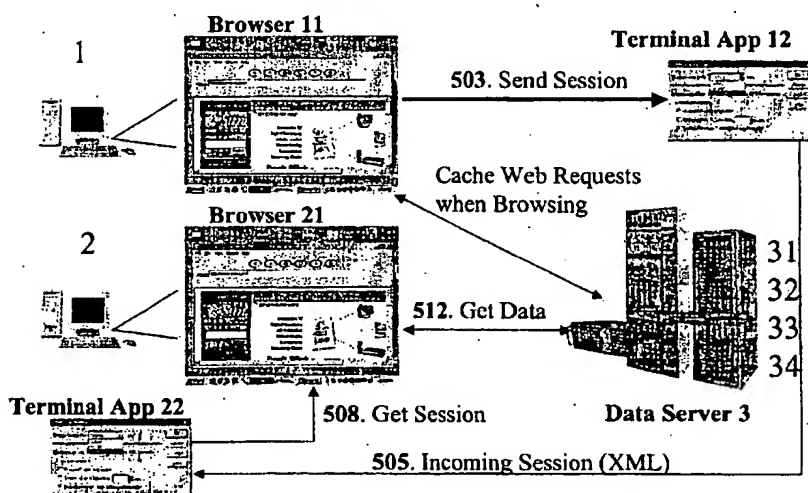
Figure 1

Description

[0001] This invention relates to the integration of communications devices.

[0002] Users often have several types of communication device available for their use. These devices function independently, which means the user has to define preferences and profiles for each device.

[0003] It would be very convenient to unify a user's range of communication devices so they all share common preferences and act as a single "virtual" terminal in which the devices are differentiated by certain attributes such as mobility. Using this unified approach will allow the user to set profiles on this virtual terminal (by inputting an instruction using one of its constituent devices), to arrange that all devices are notified of these changes. This will allow a user to start an operation such as a computing session on one device and continue it on another.

[0004] For example, a user at home may have spent several hours searching web pages related to a particular topic and may require access to these from work. Using data web session transfer will allow the web history and pages to be transferred by the click of a button. As another example, a user surfing an internet site using a personal computer may transfer the current session onto a WAP (wireless application protocol) mobile phone, in order to continue surfing whilst travelling. Any data session information for example form elements, bookmark history or browsing history may be transferred between terminals to create a session's state.

[0005] One device unifying system is a product called "Hipbone". This is discussed, for example, in

"E-Business Essentials" by Cade Metz, *PC Magazine June 21, 2000:*

"People Who Need People" by Jim Sterne in *Inc* magazine - *September 15, 2000*

"Many Happy Returnees", by J Blackwood, *Computer Shopper August 8, 2001*

"Digital Devices: Navigating the Web with friends" in *Interactive Week, February 4, 2000*

[0006] This system provides an Internet co-navigation service, which allows sales staff to 'connect browsers' with their customers and jointly view online product demonstrations, fill out complex web forms, and work through online transactions together. Among its key features are True Shared Browsing, which allows customer service and sales representatives ("agents") to co-browse with customers and navigate the web together, and synchronises the agent's and customer's activities. Using this, real-time interaction is achievable, all participants being allowed to direct the browser with the results echoed to each participant's browser. Hipbone's software supports functions such as authentication using "cookies" and order transaction processing. Using the shared browser allows form filling to be echoed to all participants. Forms can therefore be filled in using assistance from the serving participant (sales repre-

sentative). Hipbone's high level architecture is based on a proxy mechanism. Basically, every web response is held on the central application server accessed by the shared browsers.

[0007] According to the present invention, there is provided a method of operating a communications system such that connections to one terminal may be diverted to another terminal, the method comprising the steps of

creating a user profile on a server device, the user profile identifying a plurality of terminals,

generating from the user profile a set of parameters defining a virtual terminal,

storing, as parameters of the virtual terminal, details of a current communications session made using a first terminal,

on instruction from the user, diverting the routing of a communications connection supporting the session from the first terminal to a second terminal, and

transferring the details of the current session to the second terminal for use in contiuing the session.

[0008] According to a second aspect, the invention comprises a communications system ararnged such that connections to one terminal may be diverted to another terminal, the communications system comprising:

a server device for processing calls,

means for creating a user profile on the server device, the user profile identifying a plurality of terminals, and

means for generating from the user profile a set of parameters defining a virtual terminal

a store for parameters of the virtual terminal, said parameters being details of a current communications session made using a first terminal,

means for diverting, on instructions from the user, the routing of a communications connection supporting the session from the first terminal to a second terminal,

means for transferring the details of the current session to the second terminal for use in continuing the session.

[0009] The invention gives the user the ability to instantaneously transfer a data session to a range of various devices (e.g. PC to PC, PC to WAP Phone, WAP phone to PDA, etc).

[0010] The invention allows multiple sessions to be run, which can all be submitted to the destination device. In contrast with the prior art process, in which the browser is shared, in the present invention, the session is transmitted to the destination device and run on that device. The session that has been transmitted from the source device is closed.

[0011] The system can handle transfers requiring authorisation and those which are unrestricted. This means that sessions will be accessible from a range of different devices such as personal digital assistants,

mobile phones, IP phones, Personal computers and many other types of devices.

[0012] The present invention's architecture will also allow different web based transfer applications to be present by using the current architecture. For example, email applications based on session transfer may be incorporated with relative ease.

[0013] An embodiment of the invention will now be described, with reference to the Figures, in which

Figure 1 is a schematic representation of the various components making up the system, with an indicaion of the information flows which take place when the system is in operation

Figure 2 is a schematic representation of the information transfers used in generating a session

Figure 3 is a schematic representation of the use of the system to access data using terminals having different capablities

Figure 4 is a schematic representation of the information transfers used in transferring a session from one terminal to another

Figure 5 is a schematic representation of the use of the system to transfer data generated as html forms

[0014] As can be seen from Figure 1, from a high level perspective, the following components are provided. Browser applications 11, 21 running on respective terminals 1, 2 are capable of providing HTML (hypertext markup language) browsing capabilities and display any incoming active sessions. They can also each run a terminal application 12, 22. This application manages web data sessions, which may be present on a user's device 1, 2. It also processes any incoming sessions.

[0015] Session information, holding such information such as the session's web page and form parameter values etc, can be stored by the terminals and transferred between them.

[0016] The central server 3 is used for holding the session information, and also provides other data which can be used by the terminals. In particular, it holds a user profile, which holds any 'User Specific' attributes such as sessions, bookmarks etc. These include permanent attributes, attributes changeable on a specific command from the user, or attributes generated automatically, tracking the operation of the individual terminals.

[0017] The basic steps involved within the process will now be described, with reference to Figure 1. A more detailed dwscription of the process will follow with reference to Figures 2, 3, 4 and 5

[0018] A user logs into the system by using an interface to the server 3 appropriate to the terminal 1 that he is using. For example he may use a WAP interface for telephones, or HTML for devices capable of supporting that protocol, such as PCs and PDAs (Personal computers and personal digital assistants). A user profile is created on the main server 3. Once the user profile has been created, the user is invited to set any relevant pref-

erences, which are then loaded onto the terminal. The user can then run the web browser 11. Note that the terminal 1 will also allow other applications to be executed such as Email clients.

[0019] Once the web browser 11 has been launched, the user can select a "Session Tracking" option. From this point onwards, the operation of the browser 11 is tracked by the terminal application 12. The server 3 therefore stores the user's web history and browsed web pages within a session object.

[0020] When the user wants to 'transfer' a session, the destination device 2 has to be selected via the web browser 11, for example by clicking on a transfer button on the browser screen (step 503), to transfer the session. This causes a transfer request 505 to be sent to the destination device's terminal application 22. Having received an incoming request, the destination terminal application 22 requests the relevant session from the server 3 (step 508). The specified session is then transferred and displayed in the destination device's web browser 12 (step 512)

[0021] The invention gives the user the ability to instantaneously transfer a web session to a range of various devices (E.g. PC to PC, PC to WAP Phone etc)

[0022] Two sequence diagrams are shown as Figures 2 and 4, which illustrate how sessions are created and transferred. Note that Figure 4 applies to devices that can poll their input/output ports. Mobile devices and PDAs that do not have polling features will request the sessions directly through a Web interface from the server 3.

[0023] As shown in Figure 2, a user who has logged into the system using a terminal application 12 running on a terminal 1, is first presented with the terminal screen (step 401), which allows a web browser to be opened, as will be discussed (steps 407, 408). Also at logon, a session panel 31 is loaded on the server 3 (step 402) and a device list retrieval process 34 is initiated (step 403). The session panel 31 is a process which records the details of the session that is running, to allow those details to be transferred to another device when required. The device list retrieval process 34 retrieves a list of devices available to the user to which the session may be transferred, or which may require updating of functions such as voice mail activation. The list is stored in a user profile 33 and retrieved by the central server 3 (step 405) in response to a request 404 from the device list function 34. The device list may be amended by the processor 34 during the session (step 406), for example by changing settings of forwarding instructions.

[0024] The terminal screen presented to the user (step 402) includes an option to allow access to a web browser. Selecting this (step 407) opens the web browser 11 (step 408). The terminal can then retrieve attributes stored from previous sessions from the central server 3 (step 409). Thus the user logs into the server using a special application and then selects to open a web browser.

[0025]   In an alternative arrangment a standard web browser could itself have a facility to select the session-tracking feature which would then enable the server based session logging and transfer to take place when the user loads his standard browser. Some form of authentication (ie. username) would probably still be required, but the aim is to make this much easier to use and also allow users to use their standard web browser rather than a special one, which avoids the need for the user having to install a special tracking application on each device.

[0026]   Mobile devices and PDAs accessing the server will require the content to be revised for their display capabilities. Thus, a PC accessing the server 3 (step 409, see Figure 2) can use standard html language and protocols. As shown in Figure 3, a WAP - enabled telephone 4 accessing the server 3 (step 419) requires the session language to be converted by the server from html (as used in the PCs 1,2 and the server 3) into a language usable by the terminal 4 to which the session is to be transferred. The server 3, holding the user profile which includes the characteristics and capabilities of each terminal, performs the necessary conversion when it receives a request to transfer a session to such a terminal. Similarly, a PDA can use html, but with some limitations generally as a result of its small screen size and the relatively small bandwidth available for communication out the full data. If a request to transfer to a PDA 5 is received (step 429), the data server adapts the session accordingly by removing such functions. The session run on the data server 3 ("virtual terminal") is tracked in html, so that if transfer to a html-compatible terminal is required, the full capability can be made available.

[0027]   If the user has "Session Tracking" enabled, all browsed web pages are cached on the main server 3. The user sends a request to register a session (step 410) from the terminal application 12 to the central server 3. A session identity is then generated by the server 3 and stored (step 411) in the user profile 33 and transmitted to the user terminal 12 (step 412). This session is then added to the session panel 31 running on the server 3 (step 413).

[0028]   As will now be discussed with reference to Figure 4, other terminals can then retrieve these sessions. For example, the user could be browsing a search engine, and want to transfer the web session to another device, for example a mobile phone. As another example, the user may wish to move visual output from a mobile device with small display to a fixed device with a larger screen. In order to do this, the user may accesses the session by making a request to the main server. Having requested the session from the main server, the current session can be retrieved. The form is already filled with the correct search parameters. Once the session has been transferred to the other device, the user can continue to surf the web site.

[0029]   In Figure 4 it is assumed that the transfer is initiated from the device 1 initially running the session, but there may be situations, for example when the first device 1 has been disabled, when a transfer may be initiated from the device 2 to which the session is to be transferred.

[0030]   The transfer process starts when the user accesses the device list 34 from a first terminal 1 and selects a second terminal 2 to which he wishes to transfer (step 501). He then generates an instruction (502) for the browser 11 to initiate the transfer. The browser in turn instructs the terminal application 12 (step 503) to construct the transfer instruction (step 504) which is then transmitted to the corresponding terminal application 22 in the second terminal 2 (step 505). From this point the terminal 2 and central server 3 co-operate in a number of steps (509-513) similar to those performed in setting up a session initailly (409-413, Figure 2) More specifically, the browser 21 in the destination terminal 2 retrieves the user attributes from the central server (step 509) and sends a request to register a session (step 510) from the terminal application 22 to the central server 3. The session identity previously stored (step 411) in the user profile 33 is retrieved (step 511) and transmitted to the user terminal 12 (step 512). This session is then added to a session panel 32 associated with the destination terminal 2 and running on the server 3 (step 513).

[0031]   The destination terminal 21 next transmits an acknowledgment that the transfer has been successful back to the originating terminal (step 514) which updates its own copy of the session panel 31 running on the server 3 (step 515).

[0032]   As shown in Figure 5, one useful feature of the invention is the ability to transfer html forms and their respective values, that is to say not only the blank form stored on a website, but the values inserted in that form during a session. In order to transfer the form, the destination browser 21 first checks to see whether 'Session Tracking' has been activated. If so, when the transfer (step 512) takes place, the relevant data is extracted, and transmitted to the Server 3 (step 503-509). The form can then be rebuilt by the server 3 in its current state (step 510,511), and downloaded to the destination terminal 2 (step 512). Note that if the source and desctination terminals 1, 2 are of different types the layout and other features of the form may differ. The system only requires that both versions have corresponding fields for data entry, and that the server 3 can transfer entries from a given field in one version to the corresponding field in the other.

Claims

1.   A method of operating a communications system such that connections to a first terminal may be diverted to a second terminal, the method comprising the steps of

creating a user profile on a server device, the user profile identifying a plurality of terminals,

generating from the user profile a set of parameters defining a virtual terminal,

storing, as parameters of the virtual terminal, details of a current communications session made using a first terminal,

on instruction from the user, diverting the routing of a communications connection supporting the session from the first terminal to a second terminal, and

transferring the details of the current session to the second terminal for use in contiuing the session.

2. A method according to claim 1, comprising the further steps of storing information relating to each of the plurality of terminals, and on receipt of a diversion instruction adapting the details of the current communications session in accordance with the terminal to which the session is to be diverted

3. A method according to claim 2, wherein the session is translated into a data handling protocol suitable for the terminal

4. A method according to any preceding claim, wherein the diversion of routing is initiated by an instruction transmitted from the second terminal to the server device

5. A method according to claim 4, wherein the diversion of routing is initiated by an instruction transmitted from the first terminal to the second terminal, causing the second terminal to transmit an instruction to the server device

6. A communications system arranged such that connections to a first terminal may be diverted to a second terminal, the communications system comprising:

a server device for processing calls,
means for creating a user profile on the server device, the user profile identifying a plurality of terminals,
means for generating from the user profile a set of parameters defining a virtual terminal
a store for parameters of the virtual terminal, said parameters being details of a current communications session made using a first terminal,
means for diverting, on instructions from a user device, the routing of a communications connection supporting the session from the first terminal to a second terminal,
means for transferring the details of the current session to the second terminal for use in con-

tinuing the session.

7. Apparatus according to claim 6, comprising means for storing information relating to each of the plurality of terminals, and means for adapting the details of the current communications session in accordance with the terminal to which the session is to be diverted on receipt of a diversion instruction

8. Apparatus according to claim 7, comprising means for translation of a session into a data handling protocol suitable for the terminal
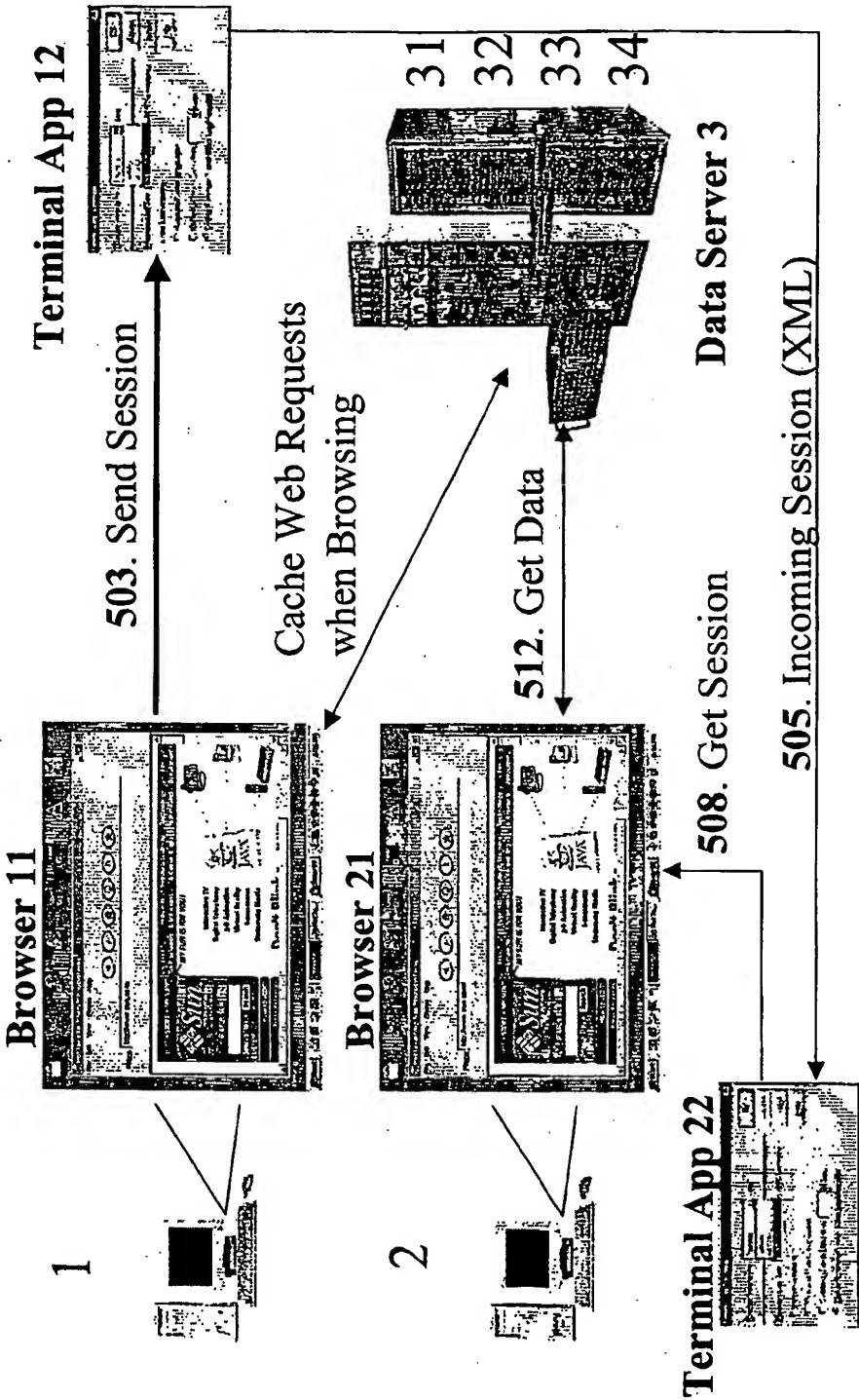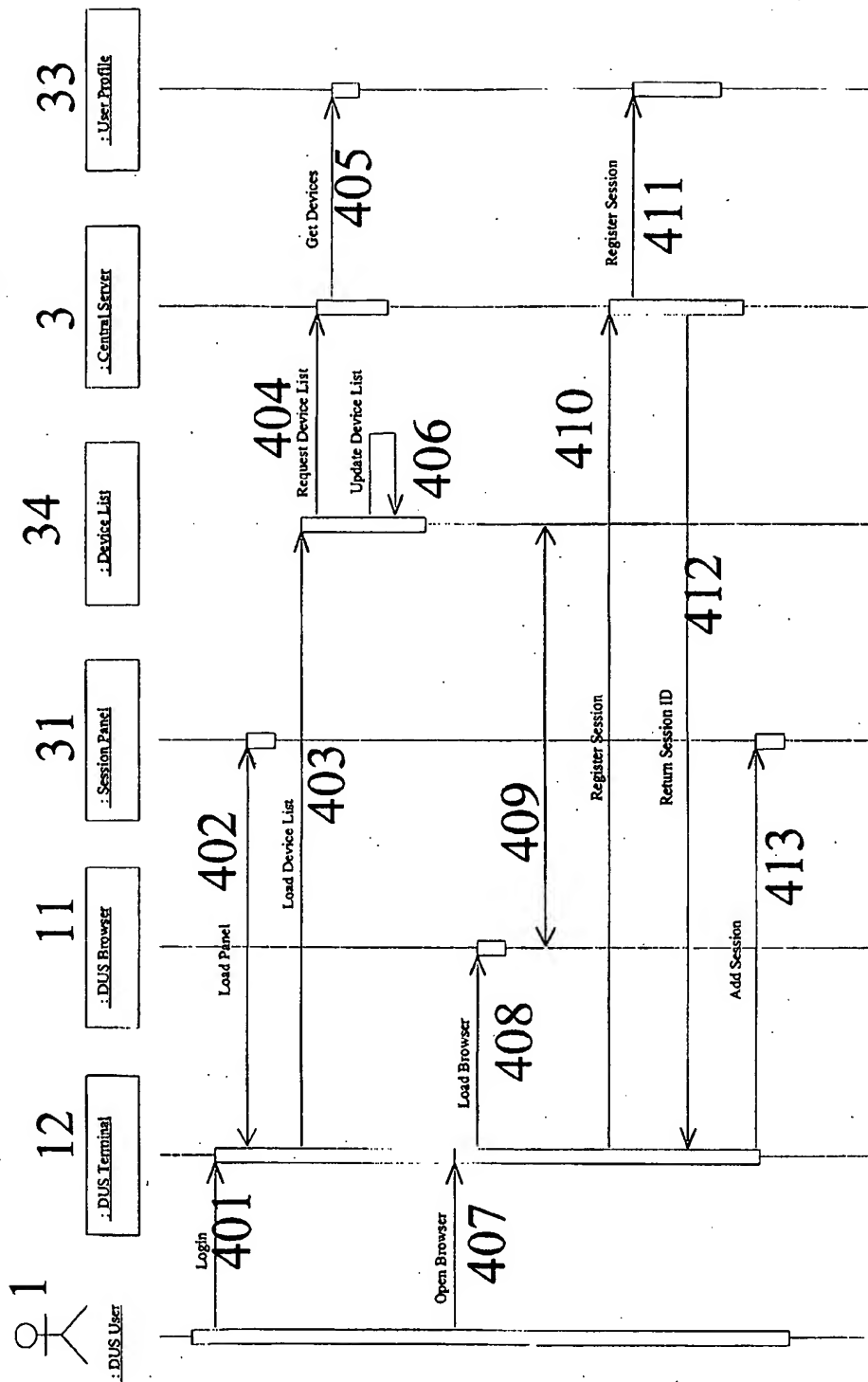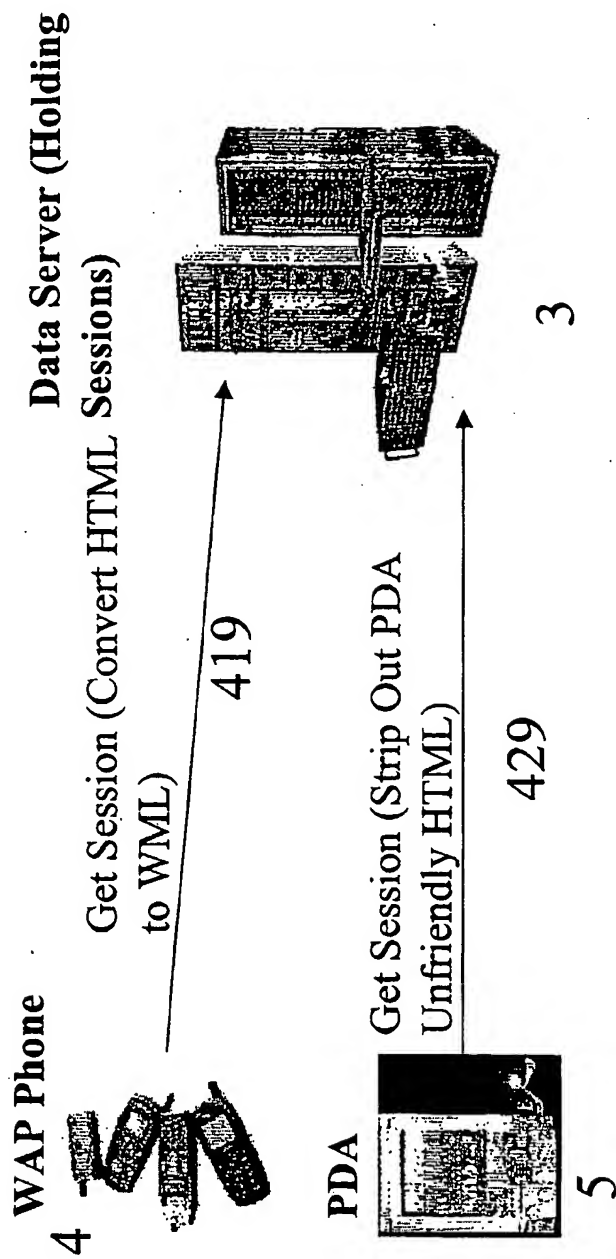
Figure 1

Terminal App 12

503. Send Session

Cache Web Requests
when Browsing

512. Get Data

31
32
33
34

Data Server 3

505. Incoming Session (XML)

508. Get Session

Browser 11

Browser 21

1

2

Terminal App 22

Figure 2

Figure 3

Data Server (Holding HTML Sessions)

3

WAP Phone

4

Get Session (Convert HTML to WML)

419

PDA

5

Get Session (Strip Out PDA Unfriendly HTML)

429

8

Figure 4

Figure 5

11

Submit
Params

503-509

Rebuild
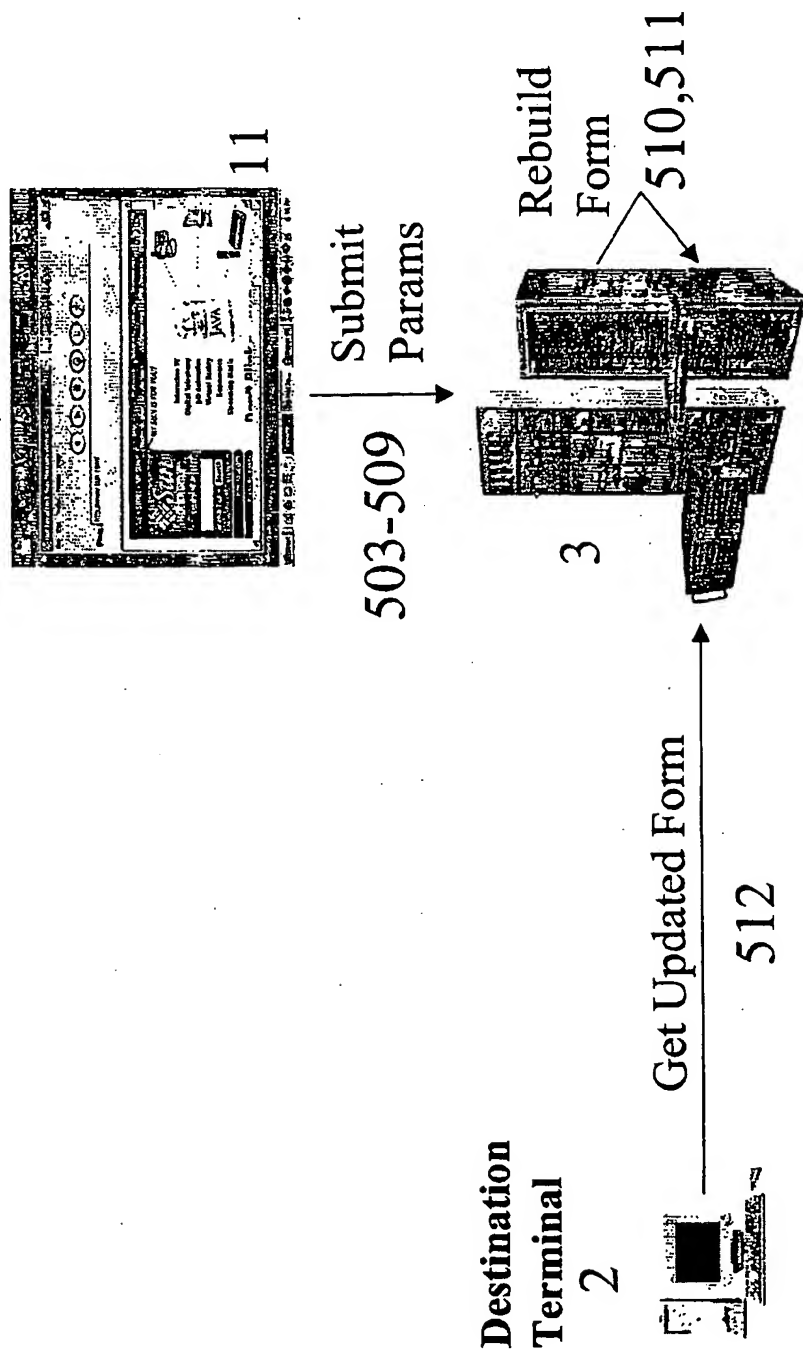Form

510,511

3

Get Updated Form

512

Destination
Terminal
2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 02 25 0380

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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X	NETSCAPE: "Flexible Roaming Access" NETSCAPE HOMEPAGE, 'Online! 2000, XP002157822 Retrieved from the Internet: <URL:http://www.netscape.com> 'retrieved on 2001-01-17! * the whole document *	1-8	
X	MAASS H: "Open mobility management platform with directory-based architecture and signalling protocols" OPEN ARCHITECTURES AND NETWORK PROGRAMMING, 1998 IEEE SAN FRANCISCO, CA, USA 3-4 APRIL 1998, NEW YORK, NY, USA,IEEE, US, 3 April 1998 (1998-04-03), pages 72-87, XP010272583 ISBN: 0-7803-4783-8 * abstract * * page 72, left-hand column, paragraph I. - page 75, right-hand column, last line; figures 1,2 *	1-8	
X	WO 00 70838 A (PATIL UMESH R ;PIVIA INC (US); JORDAN DANIEL S (US); MOHAN SUDHIR) 23 November 2000 (2000-11-23) * page 1, line 1 - page 3, line 17 * * page 5, line 4 - page 10, last line; figures 1,2,4-6,15B *	1-8	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

H04L
G06F

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	13 June 2002	Buhleier, R

EPO FORM 1503 03.82 (P04C01)

European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	13 June 2002	Buhleier, R

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 02 25 0380

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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13-06-2002

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82